

# Notes on *Olearia* (Asteraceae: Astereae) in south-east Australia: *O. tenuifolia*, *O. adenophora* and description of a new species endemic to eastern Victoria

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## Abstract

*Olearia adenophora* (F.Muell.) Benth. is reduced to synonymy under *O. tenuifolia* (DC.) Benth., and a new name, *O. curticoelo* N.G.Walsh, is provided for the population formerly treated as *O. tenuifolia* at Billygoat Bend on the Mitchell River in eastern Victoria.

**Key words:** Billygoat Bend, daisy bush

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## Introduction

While moderately widespread in south-central to south-eastern New South Wales, *Olearia tenuifolia* (DC.) Benth. is currently recognised in Victoria from a single disjunct population at Billygoat Bend above the Mitchell River, north-west of Bairnsdale in eastern Victoria. However, as noted by Walsh and Lander (1999), the Victorian plants differ from other specimens in lacking glandular hairs on the stems. Closer inspection reveals a few other important distinctions that warrant recognition of the Victorian population as a distinct entity, apparently of very restricted distribution.

In the course of examination of specimens of 'true' *O. tenuifolia* from across its range to determine the limits of its variation, it became apparent that *O. adenophora* (F.Muell.) Benth., previously regarded as being largely (or wholly) restricted to eastern Victoria, was at least closely related to the former and needed to be considered to allow proper circumscription and comparison to the new taxon. The following summarises the findings of this study.

### *Olearia tenuifolia* and *O. adenophora*

The type specimens (at G-DC) of *Olearia tenuifolia* were collected by Allan Cunningham in New South Wales, near the 'Cageegangrivier' [Cudgegong River] and Bathurst. *Eurybia tenuifolia* var. *bathurstiana* DC., based on the latter of these specimens, has less acute tips to the involucre bracts. It was not maintained by Bentham who presumably regarded the differences as trivial, a view supported here. Similar specimens may be found throughout the range of the species with no other apparent distinction. Notes by Cunningham associated with the specimens indicate an association with dry rocky country, a feature consistent across its distribution from the Cudgegong River south and east to the Australian Capital Territory and adjacent areas of New South Wales, as well as the isolated Victorian population at Billygoat Bend. Throughout its range, except in Victoria, the

stems, peduncles and usually the leaves, are variably covered with short erect, gland-tipped hairs imparting a viscid quality to these organs. Victorian plants currently referred to *O. tenuifolia* (i.e. those from Billygoat Bend) are also extremely viscid, but *inter alia*, lack the hairs of specimens from other areas. However, within Victoria, *Olearia adenophora*, occupies similar elevated rocky sites and is also viscid and hairy. As currently understood, *O. adenophora* occurs in generally small, isolated populations from near Maffra eastward to the New South Wales border, with isolated occurrences north and west to as far as West Wyalong (CHAH 2013), although it is currently not recognised in the New South Wales flora (Lander 1992; Royal Botanic Gardens and Domain Trust 2013). Specimens representing its occurrence in New South Wales derive from CANB and MEL. *Olearia tenuifolia* and *O. adenophora* are undoubtedly close and their shared attributes, similar habitats and contiguous or overlapping distribution (depending on whether its occurrence in New South Wales is accepted or not) invited closer scrutiny.

## Materials and methods

Specimens of both *Olearia adenophora* and *O. tenuifolia* at MEL and CANB, and high-resolution photographs of material determined by de Candolle as *O. tenuifolia* at G-DC and P were carefully examined. Type material of *O. tenuifolia* at G-DC was examined by Nicolas Fumeaux from that institution at my request. Features that have been used in the literature to define or distinguish the two species, namely indumentum, leaf size, involucre size and composition, and features of the cypselas were particularly scrutinised.

## Discussion

Cunningham's collections, the types of *Olearia tenuifolia*, have entire, narrow-linear leaves that are moderately glandular-pubescent. Mueller's type of *O. adenophora* has leaves that are oblong with slightly sinuate margins and are densely glandular-pubescent. However, across the range of two species, these characters are transitional and the types are near to the extremes in the traits of leaf shape and density of pubescence – i.e. the type of *O. tenuifolia* is nearly the least pubescent and narrowest-leaved of all specimens, while the type of

*O. adenophora* has nearly the broadest, most distinctly sinuate and most heavily indumented leaves. In areas near Canberra, populations could be attributed with equal (un)certainly to either species based on type specimen concepts. Specimens collected to the north of this area incline to the '*tenuifolia*' type with narrow linear leaves, and to the south plants are more likely to have slightly broader leaves, often with slightly sinuate margins. I can find no reliable difference to maintain a formal distinction between the two, even at infraspecific level, and propose that *O. adenophora* be reduced to synonymy under *O. tenuifolia*. Plants from Victoria previously included in *O. tenuifolia* fit well outside the range of variation discussed here. These plants lack hairs on stems and leaves, have inflorescences of single capitula, and larger cypselas with a much shorter pappus.

In retrospect, it is surprising that, despite not recognising *Eurybia tenuifolia* var. *bathurstiana*, Bentham (1867) maintained a distinction between the two species although, inevitably, he would have had incomplete representation of the variation and geographic distribution of them. The key to *Olearia* in *Flora Australiensis* (Bentham, 1867, 3: 467) distinguishes the two primarily on the nature of the pubescence – 'slightly glandular pubescent' for *O. tenuifolia* and 'very viscid-pubescent or hirsute' for *O. adenophora*. Comparing the (adjacent) descriptions of the two species, Bentham (1867) notes features of leaf length (half to one inch long in *O. tenuifolia*, mostly above one inch long in *O. adenophora*), capitulum size and arrangement, and ray floret number (to 15 per capitulum in *O. tenuifolia*, 20 or more per capitulum in *O. adenophora*, although Walsh and Lander (1999) give 12–18 florets for *O. adenophora* based on Victorian specimens alone). There was no consistency of association of Bentham's diagnostic features across the range of over 90 specimens examined in the course of this study. Nonetheless, plants with the broadest leaves, densest indumentum and largest capitula (according to Mueller's type of *O. adenophora*) occur in the southern part of the combined range.

There is no mention of *Eurybia tenuifolia* in the description of *Eurybia adenophora* F.Muell., which suggests that Mueller may have been unaware of the former species. There are no examples of *Olearia*



*tenuifolia* at MEL collected prior to 1887, 18 years after Mueller's description of *E. adenophora*, further suggesting that Mueller had no previous access to material of that name.

## Taxonomy

***Olearia tenuifolia*** (DC.) Benth., *Fl. Austral.* 3:486 (1867)

*Eurybia tenuifolia* DC., *Prodr.* 5:269 (1836)

**Type:** NEW SOUTH WALES. Among dense shrubs investing the base of a pine (*Callitris*) range in the country on the north of the Cudgegong [Cudgegong] River, A. Cunningham 4, May 1825 (lecto, here selected: G-DC, photo seen).

*Eurybia tenuifolia* var. *bathurstiana* DC., *Prodr.* 5:269 (1836). **Type:** New South Wales. ... in barren scrub near Bathurst, A. Cunningham 13, 13 April 1817. (holo: G-DC, photo seen).

*Eurybia adenophora* F.Muell., *Fragm.* 1:111 (1859). **Type:** Victoria. 'Ad latera montium petraeorum juxta flumen McAllister alt. 2–3000', Jan 1859, F. Mueller s.n. (holo: MEL 681752; iso: K, photo seen).

*Aster adenophorus* (F.Muell.) F.Muell., *Fragm.* 5: 78 (1865)

*Olearia adenophora* (F.Muell.) F.Muell., *Fragm.* 5: 78 (1865), *nom. inval.*, (name appears in synonymy only)

*Olearia adenophora* (F.Muell.) Benth., *Fl. Austral.* 3:486 (1867)

*Olearia rupicola* J.H.Willis, *nom. inval.*, (unpubl. name on herbarium sheet only)

***Olearia curticomma*** N.G.Walsh *sp. nov.*

**Type:** VICTORIA. Mitchell River National Park, Billygoat Bend, N.G.Walsh 7813, J.P. Walsh & R.J. Bilney (holo: MEL 2369577; iso: CANB, K, NSW, PERTH, S).

Differs from *O. tenuifolia* in the glabrous leaves and stems, leaves without a recurved margin *in vivo*, capitula with white ray florets, and conspicuously shorter pappus bristles which are not or barely longer than the ripe cypsela.

Erect shrub to c. 3.5 m high; branchlets glabrous, viscid from a copious exudate, slightly ridged from decurrencies extending from leaf midrib and margins. Leaves alternate, sessile, linear, 11–22 mm long, 0.8–1.5 mm

wide, acute, glabrous except for a few very fine, simple eglandular hairs on margins and abaxial midrib when young, but these soon caducous; lamina slightly discolorous, paler beneath; margin entire, plane *in vivo*, but appearing thickened or recurved on drying. Capitula 18–25 mm diam., solitary, terminal or subterminal on bracteate peduncles 8–25 mm long, lower bracts resembling leaves, upper bracts grading to those of the involucre; involucre ±conical, 5–7 mm long; bracts irregularly 3–4-seriate, graduating, the outermost c. 2 mm long, the innermost c. 5 mm long, all subulate, c. 1 mm wide, glabrous, viscid with sessile glands. Receptacle with fine erect ridges between florets. Ray florets 10–16, white, ligules 9–12 mm long; disc florets about twice as many as ray florets, yellow. Cypsela ±cylindrical, c. 2.5–3 mm long, with 5 or 6 prominent pale ribs at maturity, sericeous; pappus bristles scabrous, the longest equal to, or slightly longer than body of cypsela, to 3 mm long, pale or slightly rufescent. Flowers December–May (5 records). (Figs 1–3).

**Specimens examined:** (all from type locality) 16.xii.1972, K.C. Rogers s.n. (MEL); 17.v.1975, J.H. Willis s.n. (MEL, ?NSW); A.C. Beaglehole 41739 (LTB, MEL); J. Turner 1077 (MEL).

**Distribution and habitat:** *Olearia curticomma* occurs in dry open forest dominated by *Eucalyptus sieberi* L.A.S. Johnson with other common components being *Cassinia longifolia* R.Br, *Dodonaea viscosa* subsp.



**Figure 1.** Flowering stem of *Olearia curticomma* (photograph J.Eichler)

*spatulata* (Sm.) J.G.West, *Acacia terminalis* (Salisb.) J.F.Macbr., *Stypantra glauca* R.Br., *Gahnia radula* (R.Br.) Benth., *Lepidosperma urophorum* N.A.Wakef., *Sannantha pluriflora* (F.Muell.) Peter G.Wilson and *Pomax umbellata* (Gaertn.) Sol. ex A.Rich. Soils are shallow and sandy or gravelly, derived from Pleistocene alluvium overlying upper Devonian–lower Carboniferous sandstones.

This species appears to be confined to a single population above Billygoat Bend on the Mitchell River. The general vicinity is regarded as well-explored but no further populations have been detected (R. Bilney, pers. comm.). The high, exposed aspect of this site immediately above a substantial cliff line adjacent to the Mitchell River appears to be unique in the area, suggesting that *O. curticoma* may indeed be a very restricted habitat specialist.

**Conservation status:** Applying IUCN criteria (IUCN 2012), *Olearia curticoma* is assessed as Critically Endangered (CR) on the basis of its occurrence at a single site, even though there are no immediate severe threats to the species. There is evidence of some plants being subjected to stem damage by the introduced Asian deer, Sambar (*Rusa unicolor* (Kerr, 1972)). This damage should be monitored over time to ensure that the population as a whole is not threatened by it as has occurred with the rainforest shrub *Achronychia oblongifolia* (Hook.) Heynh. (Rutaceae) in the same general area (Bilney 2013), and

*Nematolepis wilsonii* (N.G.Walsh & Albr.) Paul G.Wilson in south-central Victoria (Bennett & Coulson 2011).

**Notes:** *Olearia curticoma* is probably closely related to *O. tenuifolia*, differing primarily in the glabrous stems and shorter pappus bristles. Ray florets are white in *O. curticoma* but mauve or pink in *O. tenuifolia*. Plants are generally taller (to 3.5 m high) and less spreading than *O. tenuifolia* (to 2 m high). The very sticky exudates of these two species have distinctly different odours. In *O. curticoma* the smell resembles that of Neatsfoot Oil and related leather-conditioning products, whereas in *O. tenuifolia* the smell is described in herbarium collections as 'sweet', 'fruity' or 'like bubble-gum'. While in herbarium specimens, the leaves of *O. curticoma* appear to have recurved or thickened margins, the margins of fresh leaves are at the same level as the midrib and intervening tissue. The latter shrinks on drying, creating the effect of a raised margin. By contrast, the leaves of *O. tenuifolia* have distinctly recurved margins, even in the fresh state. Probably more closely related to *O. curticoma* is *O. passerinoides* subsp. *glutescens* (Sonder) D.Cooke, which shares leaf morphology, similarly viscid and odorous stems and leaves, and broadly similar capitula. Major differences of *O. passerinoides* subsp. *glutescens* include the (usually) smaller leaves, slightly smaller capitula that are usually borne in corymbs, less acute involucre bracts that have minutely fimbriate margins, and shorter (to 2 mm long) cypselas with pappus bristles that are at least twice as long as the cypselas body. This taxon occurs in south-eastern South Australia and has been recently recorded from near Bendigo in Victoria. It inhabits mallee and dry woodland communities usually on infertile soils.



Figure 2. Plant of *Olearia curticoma* in situ (photograph J.Turner)



Figure 3. Cypselas of *Olearia curticoma* (from Walsh 7183)



The short pappus and relatively bulky cypselas of *O. curticomma* undoubtedly reduce the potential for wind dispersal and may partly explain the species' restricted distribution. Its response to fire is not known, but the sole population appears to be composed of relatively uniformly aged individuals, suggesting that plants are killed by fire and that the seed may require fire (or smoke) to trigger germination. Germination trials will be undertaken by the Victorian Conservation Seedbank at the Royal Botanic Gardens Melbourne.

The earliest collection of this species at MEL was made in 1972, surprisingly late in the botanical exploration of the state, from a site that has long been readily accessible by foot or vehicle. It was not recorded by Willis (1973), but a 1975 collection by him (cited above) bears the annotation '*O. rupicola* sp. nov.' That name however was never published. Beauglehole (1980) treated the species as '*Olearia* sp. aff. *glutinosa*'. *Olearia glutinosa* (Lindl.) Benth. is a compact, coastal species differing from *O. curticomma* in having corymbose inflorescences, capitula with shorter ligules to the ray florets and cypselas with longer pappus bristles. Following Nicholas Lander's determinations of these and other specimens at MEL as *O. tenuifolia* in 1986, that name has, until now, been accepted for the Billygoat Bend population.

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